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SOME INDIANA ACRIDIDÆ.—III.

BY W. S. BLATCHLEY, TERRE HAUTE, INDIANA.

(Continued from page 223.)

Among the species of *Pezotettix* occurring in Indiana, there is one which I have never been able to place satisfactorily to myself. In my first paper on Indiana Acrididæ I called it *P. rotundipennis*, Scudder, upon the authority of Mr. S. H. Scudder, to whom specimens had been sent. Afterwards other specimens were sent to Prof. Lawrence Bruner, of Lincoln, Nebraska. He referred them doubtfully to *P. unicolor*, Thomas, stating that he had never seen *unicolor*, but that in his opinion they were not *rotundipennis*, as they differed materially from authenticated specimens of that locust in his collections from Florida.

I then let the matter rest for three years, when, finding no description agreeing with the insect, and having received nothing like it in exchange, I sent a number of specimens to Mr. A. P. Morse, of Wellesley, Mass., who carefully compared them with Mr. Scudder's types of *rotundipennis*, and pronounced them different. Mr. Scudder, after a second and more careful comparison, also pronounces them different. That they are not *unicolor* anyone who will carefully compare them with Thomas's description (Syn. Acrid., 151) or with the figure of that species (Pl. XLIV. Orth. of Wheeler Survey, 1875) will readily ascertain.

Taking the above facts into consideration, I believe the species to be new to science, and describe it herewith as follows :

PEZOTETTIX OBOVATIPENNIS sp. nov.

Pezotettix rotundipennis, Scudder, Blatchley, Can. Ent., XXIII., 1891, 80.

A *Pezotettix*, the ♂ of which is below the medium in size ; the ♀ much larger, and quite robust. The tegmina are shorter than the pronotum, obovate in outline, a little longer than their greatest breadth, and reach but little beyond the first abdominal ring. In the ♀ they are separated

from each other on the dorsum by a space equal to three-fourths their greatest width; proportionally nearer in the ♂. Wings represented by a slender, oblong scale, which does not reach the tympanum.

Pronotum with both anterior and posterior margins subtruncate; the sides of the posterior lobe finely and densely punctate. The disk in ♂ with the lateral margins slightly divergent only on posterior half; in ♀ obviously divergent throughout their entire length, so that the posterior margin of disk is one-third wider than the anterior. Median carina distinct and equal throughout, the lateral carinae present but indistinct, especially on the posterior lobe. Occiput, tumid, prominent. Vertex between the eyes broader than basal joint of antennae in ♀, of equal breadth in ♂; the margins somewhat elevated above the slightly depressed centre and continuous with the margins of the frontal costa; the latter not sulcate in the ♀, slightly so above ocellus in ♂. Eyes prominent. Cerci of ♂ oblong, the basal third slightly broader than apical third, the middle narrower; the apical half but little curved inward, and but slightly excavated on its exterior face. The hind femora shorter than abdomen in ♀.

Colour of dried specimens: Above, dull grayish-brown or tan. A shining black band starts from the middle of posterior margin of each eye, and passes back, covering the upper half of lateral lobe of pronotum, then narrows and curves downward to coxa of middle leg. Below, this is bordered by an ivory-white band, which extends back from cheek and covers lower half of lateral lobe of pronotum, and then curves down between the front and middle coxa. The metapleurite is also ivory-white. Below, the general colour is a dirty yellowish-brown, with the lower face of the femora orange-yellow. The hind femora with their apices black, and with two indistinct blackish bars on the upper and outer faces. Hind tibiae olive-green, annulate with whitish near the base, the spines black. Antennae with the basal half reddish-brown, the apical half fuscous.

Measurements: Length of body, ♂, 16 mm., ♀, 24 mm.; of antennae, ♂, 9 mm., ♀, 9.5 mm.; of tegmina, ♂, 2.7 mm., ♀, 4 mm.; of hind femora, ♂, 10 mm., ♀, 12.5 mm.; of hind tibiae, ♂, 9 mm., ♀, 10.5 mm.

According to Morse, the following are the chief differences between *obovatipennis* and Mr. Scudder's *rotundipennis*: The hind femora of the latter are much stouter, and the sides of pronotum more divergent. The anal cerci of *obovatipennis* are flatter, more erect, and more nearly equal in breadth and thickness throughout. The width of supra-anal plate,

instead of being equal to the length, as in *rotundipennis*, is much narrower than the length. The greatest difference, however, is seen in the marginal apophyses of the segment preceding the anal plate. In *obovatipennis* these are arched, divergent, tapering, and of considerable length, with a deep and narrow notch on each side at base; while in *rotundipennis* they are fully developed as slight flattened triangular projections, shorter than broad, and with the base not notched.

No description is extant of the ♂ of *P. unicolor*, Thomas. The following characters, from the description of the ♀, will show that it is distinct from *obovatipennis*:

"Sides of pronotum parallel; carinae equally distinct. Elytra half as long as abdomen, oblong-ovate. Hind femora passing the abdomen slightly. Colour, reddish brown throughout."

In general appearance *obovatipennis* resembles somewhat *Pez. manca*, Smith, but the ♀ of the former is much larger and more robust, with the disk of pronotum flatter, the sides more divergent, and the vertex broader. The tegmina are shorter, and with a much narrower base than those of *manca*, while the two species differ materially in colour.

Obovatipennis has been taken only in Vigo and Monroe counties. It reaches maturity about September 1st, and frequents, for the most part, high, dry, open woods, especially those in which beech and oak trees predominate. On the tops of the hills, in the coal district of Vigo Co., where the soil is a clay, and the herbaceous vegetation somewhat limited, it is the prevailing, and often only, representative of the family. In late October, if the season is dry, it is often found in company with *Chrys-ochraon viridis* and *Truxalis brevicornis* among the reeds and tall, rank grasses near the border of marshes, and as late as November 22nd has been noted enjoying the afternoon sunshine from a perch on the bottom plank or rail of a fence. The ♀'s are always much more numerous than the ♂'s, the ratio being about 8 to 1. Their larger, robust form renders them more clumsy, and hence more readily caught by the hand, the ♂'s being active leapers, and requiring quick movement on the part of the collector to effect their capture.

PEZOTETTIX OCCIDENTALIS, Bruner. (C. E., XXIII., 81.)

This is the *Pez. viola* of my first paper. When that was prepared, I considered *P. viola* and *P. occidentalis* as synonyms, but having received typical examples of the former from Prof. McNeill, I find them to be distinct.

Occidentalis is probably the least common species of the genus in the State, its general range being more western.

PAROXYA ATLANTICA, Scudder.

Paroxya atlantica, Scudder, Proc. Bost. Soc. Nat. Hist., XIX., 29.

My *Pezotettix hoosieri* (C. E., XXIV., 31) is doubtless a short-winged form of this species. Typical specimens of *atlantica* recently received from Mr. A. P. Morse differ only in being much duller in colour, and in having the tegmina reaching to end of abdomen. I have taken hundreds of the form *hoosieri* in this State, and in no one have the tegmina reached beyond the middle of abdomen, but wing length in orthoptera is a character of but little importance. In Mr. Scudder's original description of *atlantica*, the length of antennæ of ♂ is given as 10 mm., whereas, in the examples received from Mr. Morse, and in all taken in Indiana, they are fully 15 mm. in length.

I have found this species in but two localities in the State, viz.: about the margins of a large pond in Vigo County, and in a tamarack swamp in Fulton County. It is abundant in both places from August to October.

MELANOPLUS COLLINUS, Scudder. (C. E., XXIII., 99.)

For the past three years this has been a very common locust, reaching maturity in this vicinity about July 15th. Like the next species and *Pezotettix gracilis*, it delights to carry on its courtship among the leaves and branches of the iron weed, and hundreds may be taken there, many of them in copulation, as early as August 1st. While of about the same length, the females are much more robust than those of either *M. femor-rubrum* or *M. atlantis*, and the tegmina just reach the tip of or are a little shorter than the abdomen, instead of exceeding it as in those species. It doubtless occurs throughout Indiana, having been taken on the border of Lake Michigan, by Prof. Slick.

MELANOPLUS BIVITTATUS, Say. (C. E., XXIII., 99.)

A common species in early summer, making its appearance about June 15th, and disappearing by mid-September.

Mr. Scudder considers *M. femoratus*, Burmeister, as distinct from this species, stating* that: "*bivittatus* has the hind tibiæ glaucous and yellow; in *femoratus* they are red; and the two species can be instantly distinguished by these peculiarities."

*Report Brit. N. A., Bound Survey, 1875, 343.

I have taken in Northern Indiana a glaucous-legged ♂ in copulation with a red-legged ♀, and also specimens in which the tibiæ were dark brown at base, greenish or glaucous in the middle, and red on the apical third. Specimens from New England, labeled *femoratus*, by Prof. Morse, differ in no wise from those from Indiana, called *bivittatus* by as able an authority as Prof. Lawrence Bruner. I am, therefore, constrained to believe that the two so called species are one and the same, Say's name having the priority.

MELANOPLUS GRISEUS, Thomas. (C. E., XXIV., 30.)

On September 24th, 1893, I found this locust to be quite common within the depths of a tamarack swamp in Fulton Co. While other *Acrididæ* were common up to the very border of the tamarack growth, this and two species of grouse locusts were the only ones found within this border. Several pairs were taken in coitu. It was not an active insect—usually, after one or two short leaps, squatting close to the earth, and seemingly depending upon the close similarity of its hues to the grayish lichens about it to avoid detection.

* *

Other than the Tettiginæ, the earliest dates at which mature locusts have been taken in Vigo County are as follows :

Schistocerca americana, Drury, April 11th, 1893. Blown in by storm.*

Chortophaga viridifasciata, De Geer, Apr. 15th, 1894.

Arphia sulphurea, Fab., May 5, 1894.

Pezotettix viridulus, Walsh, May 11, 1894.

CANADIAN HYMENOPTERA—No. 6.

BY W. HAGUE HARRINGTON, F. R. S. C., OTTAWA.

This paper contains the descriptions of the remaining new species of Ichneumonidæ from Vancouver Island. For the generic determinations of Amorphota, Semiodes, Phobetres and Hypocryptus, representing genera not hitherto recognized in America, I am indebted to Mr. Ashmead.

Sub-family ICHNEUMONIDÆ.

TROGUS FLETCHERII, n. sp.

Female—Length, 14 mm. Black with brownish abdomen and ferruginous legs. Head black; face beneath antennæ, narrow orbits,

*See Psyche, June, 1893.

palpi and mandibles ferruginous; antennæ long, slender, brown above, the scape and basal half of flagellum beneath, ferruginous. Thorax black, coarsely punctured; two short lines on mesonotum; scutellum, posterior face of metathorax, tegulæ and sutures at base of wings, ferruginous; legs, including coxæ, entirely pale ferruginous, or rufotestaceous; wings large, yellowish; nervures ferruginous, the costa darker. Abdomen as in *exesorius*, but more coarsely sculptured and of a brownish colour, the first segment and base of second a little paler.

Described from one of two ♀ specimens bred by Mr. Fletcher from the pupæ of a Vancouver Island papilio, and named after him in recognition of the fact that to his example and incentive I owe my interest in entomology.

Sub-family OPHIONINÆ.

ANGITIA AMERICANA, n. sp.

Female—Length, 6 mm. Black, with partly rufous legs. Head small, polished; face opaque, but scarcely sericeous; clypeus slightly swollen, with a small tubercle above; antennæ reaching to middle of abdomen, slender, filiform, 19-jointed, joints 3-5 gradually decreasing in length, remaining joints sub-equal, the apical joint flattened internally. Thorax longer than high; mesonotum and pleuræ polished, the former indistinctly punctulate; scutellum rather prominent; metathorax declivous, areolated and punctate, the central area fusiform and less coarsely sculptured; legs slender; base of all the coxæ, the trochanters and the tarsi piceous; femora and four anterior tibiæ rufous, the posterior tibiæ dusky; wings hyaline, iridescent; stigma sub-triangular and with the nervures brownish, areolet sub-pentagonal, the outer transverse nervure less distinct. Abdomen strongly compressed towards apex, piceous-black and highly polished; first segment long and slender, not expanded at tip, which is faintly sulcate, spiracles near apex; second and third segments long, the incisure almost invisible; remaining segments short and slightly retracted; ovipositor scarcely exerted.

Described from one ♀ specimen from Victoria, V. I. (Taylor.)

PYRACMON VANCOUVERENSIS, n. sp.

Female—Length, 10 mm. Black, legs and abdomen in part rufous. Head sub-quadrate, as wide as thorax, black, distinctly punctate; entire face below antennæ, interior orbits nearly to summit of eyes, cheeks below the eyes, mandibles except tips, palpi and scape of antennæ, yellow; a puncture at each upper angle of clypeus; antennæ long, slightly

swollen medially and attenuated apically. Thorax with rather coarse punctures; those of the pleuræ and pectus less closely placed, a conspicuous suboval polished spot beneath the insertion of wings; metathoracic areas well defined; legs rufous, including the coxæ, the anterior pair paler, with coxæ and trochanters yellow, the intermediate coxæ and trochanters also partly yellow; posterior tibiæ darker towards apex, and tarsi yellowish; wings hyaline, stigma and nervures dark brown; areolet triangular, the outer transverse nervure incomplete, only extending two-thirds the distance across the cell; if complete it would meet the second recurrent nervure; tegulæ pale. Abdomen rufous; the petiole, apex of segment three, and following segments above, black; ovipositor scarcely exerted.

Described from one ♀ specimen from Victoria, V. I. (Taylor.)

AMORPHOTA, n. sp.

A species referred to this genus is found in Mr. Taylor's collection, but it has been damaged, and the abdomen is now missing. It is therefore not advisable to describe the species until further material is received. There is a possibility of its having been described as a *Limneria*.

Sub-family. TRYPHONINÆ.

SEMIODES SEMINIGER, n. sp.

Male—Length, 7.5 mm. Black, with legs and abdomen rufous. Head transverse, as wide as thorax, truncate posteriorly, rather coarsely punctured, a semi-circular carina below the antennæ; face and cheeks with yellowish pubescence; clypeus, mandibles, and scape beneath, rufous; antennæ nearly as long as body, moderately short at base and attenuated toward apex, about 30-jointed. Thorax entirely black, lobes of mesonotum distinct, the central more strongly punctured than the lateral; metathorax truncate posteriorly and strongly areolated; legs rather stout, the posterior femora slightly swollen; all bright rufous, including the coxæ; wings hyaline, tinged with yellowish, the nervures brownish, the areolet small, sub-pentagonal. Abdomen petiolate, entirely rufous except petiole; the first segment gradually expanded to apex, spiracles beyond the middle, two dorsal carinæ not reaching the apex; first segment and base of second sub-aciculated, the rest of abdomen polished and feebly punctulate.

Described from one ♂ specimen from Victoria, V.I. (Taylor.)

PHOBETES CANADENSIS, n. sp.

Female—Length, 7.5 mm. Mostly ferruginous. Head transverse, emarginate posteriorly, pale ferruginous; eyes black; a spot enclosing the ocelli, others at the base of antennæ and of the mandible, black; clypeus, mandibles, palpi and lower orbits yellowish; antennæ testaceous, nearly as long as body and rather stout, about 30-jointed. Thorax ferruginous, with the sutures more or less black; mesonotum rather prominent, indistinctly punctulate; scutellum convex; metathorax rounded posteriorly with a triangular central area enclosed by feeble carinæ; spiracles circular; legs rufous, all the tarsi paler; wings hyaline, tinged with yellowish, nervures brownish, no areolet. Abdomen broadly fusiform, ferruginous, the apical segments dusky; the first segment expanded beyond the spiracles, the dorsal carinæ almost obsolete; first and second segments sub-opaque, densely, finely punctulate; ovipositor scarcely exerted.

Described from one ♀ specimen from Victoria, V. I. (Taylor.)

HYPOCRYPTUS VANCOUVERENSIS, n. sp.

Male—Length, 6.5 mm. Black, with legs and middle of abdomen rufous. Head rather large, about twice as wide as long; vertex rounded and smooth, with fine punctuation; face below the antennæ with fine silvery pubescence; a spot on mandible and the palpi pale; antennæ stout, as long as head and thorax, black, with a yellow spot on scape beneath. Thorax entirely black; mesonotum closely, finely punctulate; pleuræ shining, indistinctly punctured; metathorax truncate posteriorly, strongly areolated and rugosely punctured; legs pale rufous, including coxæ; the four anterior trochanters yellowish; base of posterior coxæ, trochanters, tips of tibiæ and tarsi dusky; wings hyaline, nervures brownish, no areolet. Abdomen sub-petiolate, the first segment expanded posteriorly and with two sub-obsolete dorsal carinæ; segments one and two, with base of three, densely, opaquely punctulate; terminal segments polished and sparsely punctulate; first and apical segments black; two, three, four, except sides, and spot at base of five, rufous.

Described from one ♂ specimen from Victoria, V. I. (Taylor.)

Sub-family PIMPLINÆ.

EPHIALTES PACIFICUS, n. sp.

Female—Length, 20-25 mm., with ovipositor 40-50 mm. Black, legs rufous. Head polished; face with yellow pubescence, longer on clypeus;

palpi pale; antennæ slender, shorter than the abdomen. Thorax polished, with faint, sparse punctures on mesonotum and pectus; metathorax more coarsely punctate, feebly sulcate, the carinæ obsolete; tegulæ, with a brief line before, white; legs, including coxæ, rufous; posterior tibiæ and tarsi brownish; wings hyaline, iridescent, areolet sub-triangular. Abdomen slender, coarsely punctured; first segment carinate and sulcate only at base; segments 2-4 nearly twice as long as the first, which is shorter than fifth; apical third of segments 2-6 polished and transversely wrinkled; ovipositor rufous, twice as long as the abdomen; sheaths black, coarsely pubescent.

Male—Length, 8 mm. Differs from ♀ in being so much smaller and in having the legs somewhat paler. The anterior coxæ and trochanters, a spot on intermediate, and a small annulus at base of posterior tibiæ, white. Abdomen slender, segments of almost equal length.

Described from three ♀ and one ♂ specimens from Victoria, V. I. (Taylor.) The diminutive ♂ may belong to a different species, but it resembles this much more closely than it does any other species from British Columbia.

EPHIALTES VANCOUVERENSIS, n. sp.

Female—Length, 16 mm., with ovipositor 30 mm. Black, with rufous legs. Head finely punctulate; face sericeous, edge of clypeus and tips of mandibles rufous, palpi white; antennæ slender, 10 mm. long. Thorax finely sculptured; mesonotum finely, transversely rugulose, pleuræ densely punctate; lateral margin of prothorax yellow, with a highly polished groove above; metathorax closely punctured, feebly sulcate, carinæ obsolete; four anterior legs, including coxæ, yellowish; the intermediate with the femora and tibiæ externally rufous, and the tarsi brownish; posterior coxæ, trochanters and femora rufous, the tibiæ and tarsi black; wings hyaline, stigma and nervures black, areolet sub-triangular and sub-petiolate. Abdomen finely sculptured and not tuberculate, except obsoletely on the basal segments; first slightly longer than second, not carinate or sulcate; three following segments of equal length, remaining segments gradually shorter and more finely punctulate; ovipositor as long as body, red, with black, finely pubescent, sheaths.

Described from one ♀ specimen from Victoria, V. I. (Taylor.)

ARENETRA PALLIPES, n. sp.

Male—Length, 10–12 mm. Black, with rufous legs. Head coarsely punctate; face and cheeks with very dense greyish pubescence; antennæ long and stout. Thorax more coarsely punctured, less pubescent, the pleuræ somewhat shining; all the coxæ and trochanters black, remainder of legs rufous, except posterior tibiæ, which are brownish; wings iridescent, sub-hyaline; stigma and nervures black. Abdomen finely sculptured, except the first segment, which is coarsely punctate at base and longitudinally aciculate at summit; lateral margins of segments 1–4 yellowish, apical margin of 2–6 narrowly white.

Described from five ♂ specimens from Victoria, V. I. (Taylor), dated February, March and April, 1886, and marked as "Very common, flying over garden at Cedar Hill."

COLEOPTERA TAKEN AT LAKE WORTH, FLORIDA.

BY JOHN HAMILTON, M. D., ALLEGHENY, PA.

Lake Worth is an elongated bay connected with the ocean, two and one-half miles from its northern end, and separated from it by a narrow elevated strip of land, varying in width from two hundred to nine hundred yards. Its length is about 20 miles, while in width it averages about thirteen hundred yards. The country adjacent to the west shore is largely in its primitive state—white sand overgrown with Saw Palmetto, scrub live oak and many other shrubs and vines, with occasionally some pines. The flora of the strip between the lake and the ocean is designated the semi-tropical forest by Mr. Schwarz, who has largely developed the coleopterous fauna of South-eastern Florida.

The part of the lake and the ocean beach where this collection was made is that north from the inlet in about lat. $25^{\circ} 40'$, long. 80° , this part of the coast being the most eastern point of Florida, and almost touched by the Gulf stream. The collecting was done from February 18th to April 18th, a season of the year when most insects have disappeared in these warm regions, as is well known, just as they do at the north during the same months. Insects were, perhaps, scarcer than usual on account of the dryness of the season, there having been no rain from December till my departure, and the temperature by night mostly 70° , and that of midday 84° .

The whole number of species taken was 172; of these, eleven are undetermined, being either *aleocharini* or small things, only one of which is thought to be undescribed; of the others, 97 are very widely distributed; 40 (marked with a †) extend westward in the Gulf States, some of these as far as Texas; while only 25 (marked *), so far as known to the writer, have not occurred northward from Florida.

How many additional species exist in the territory collected over is conjectural, but certainly not more than 150, and these must be largely of species whose larvæ live in wood and fruits or seeds. The character of the soil, that of the flora and the long continued droughts militate against a coleopterous fauna prolific in species. This statement, however, applies only to this and similar localities.

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| † <i>Cicindela tortuosa</i> , Dej. | <i>Anisodactylus</i> var. <i>merula</i> , Dej. |
| † <i>media</i> , Lec. | <i>nitidipennis</i> , Lec. |
| <i>marginata</i> , Fab. | <i>Copelatus glyphicus</i> , Say. |
| <i>Psimachus marginatus</i> , Fab. | <i>Thermonectes basilaris</i> , Harr. |
| <i>Scarites subterraneus</i> , Fab. | * <i>Cybister olivieri</i> , Crotch. |
| <i>Dyschirius</i> var. * <i>falciger</i> , Lec. | <i>Tropisternus glaber</i> , Hbst. |
| <i>Ardistomis obliquata</i> , Putz. | † <i>Hydrocharis castus</i> , Say. |
| <i>Bembidium contractum</i> , Say. | <i>Philhydrus</i> var. † <i>simplex</i> , Lec. |
| † <i>Tachys columbiensis</i> , Limer. | † <i>Phœnonotum extriatum</i> , Say. |
| <i>nanus</i> , Gyll. | ? <i>Homalota</i> , 3 species. |
| † <i>Loxandrus agilis</i> , Dej. | <i>Aleochara bimaculata</i> , Grav. |
| <i>Diplochila major</i> , Lec. | <i>nitida</i> , Grav. |
| * <i>Platynus</i> var. <i>floridanus</i> , Lec. | <i>Creophilus maxillosus</i> , Linn. |
| <i>punctiformis</i> , Say. | <i>Staphylinus prælongus</i> , Mann. |
| <i>Galerita lecontei</i> , Dej. | <i>Belonuchus formosus</i> , Grav. var. * |
| † <i>Tetragonoderus intersectus</i> , Germ. | <i>Philonthus hepaticus</i> , Er. |
| <i>Lebia marginicollis</i> , Dej. | <i>alumnus</i> , Er. |
| <i>Brachinus cordicollis</i> , Dej. | <i>micans</i> , Grav. |
| <i>Chlaenius fuscicornis</i> , Dej. | <i>Actobius cinerascens</i> , Grav. |
| <i>laticollis</i> , Say. | <i>Cafius bistriatus</i> , Er. |
| <i>Oodes americanus</i> , Dej. | <i>Xantholinus</i> , sp. |
| <i>lecontei</i> , Chaud. | <i>Lithocharis corticina</i> . |
| <i>Agonoderus infuscatus</i> , Dej. | <i>Erchomus ventriculus</i> , Say. |
| † <i>Selenophorus fossulatus</i> , Dej. | <i>Bledius fumatus</i> , Lec. |
| † <i>Acupalpus rectangulus</i> , Chaud. | † <i>punctatissimus</i> , Lec. |

- basalis, Lec.
Coccinella sanguinea, Linn.
Chilocorus bivulnerus, Muls.
Exochomus marginipennis, Lec.
† *Contristatus*, Muls.
Hyperaspis signata, Oliv.
Silvanus rectus, Lec.
* *Hemipeplus marginipennis*, Lec.
* *Mycetophagidæ*.—New gen. and spec.
Dermestes nubilus, Say.
Hister parallelus, Say.
* *Chelioxenus xerobatis*, Hubbard.
Saprinus pennsylvanicus, Payk.
† *placidus*, Er.
* *ferrugineus*, Mars.
sp. not determined.
† *Plegaderus barbelini*, Mars.
Carpophilus pallipennis, Say.
mutillatus, Er.
Colastus semitectus, Say.
* *Brachypeplus glaber*, Lec.
Conotelus obscurus, Er.
† *Epuræa luteola*, Er.
sp. indetermined.
Stelidota geminata, Say.
octomaculata, Say.
strigosa, Gyll.
Omosita colon, Linn.
* *Smicrips hypocoproides*, Reit.
Tenebrioides corticalis, Mels.
Monotoma fulvipes, Mels.
Heterocerus var.—of *substriatus*, Mels.
collaris, Kies.
Cyphon variabilis, Thunb.
† *Lacon curtus*, Lec.
Monocrepidius vespertinus, Fab.
auritus, Hbst.
- † *Ischiodontus ferreus*, Lec.
† *Orthostethus infuscatus*, Germ.
Melanotus dubius, Lec.
sp. indetermined.
Buprestis lineata, Fab.
Chrysobothris floricola, Gory.
Brachys tessellata, Fab.
† *Pyropyga minuta*, Lec.
† *Photinus consanguineus*, Lec.
Chauliognathus marginatus, Fab.
Collops tricolor, Say.
Necrobia rufipes, Fab.
Sitodrepa panicea, Linn.
Cis, sp.
† *Canthon nigricornis*, Say.
Chœridium Lecontei, Harold.
Copris minutus, Drury.
* *gopheri*, Hubbard.
† *Phanæus igneus*, MacL.
Onthophagus tuberculifrons, Harold.
* *Aphodius troglodytes*, Hubbard.
Atænius strigatus, Say.
Trox suberosus, Fab.
scaber, Linn.
Strategus antæus, Fab.
Cremastochilus harrisii, Kirby.
† *Trichius texanus*, Horn.
Elaphidion inerme, Newm.
unicolor, Rand.
† *Plectromerus dentipes*, Oliv.
† *Callichroma splendidum*, Lec.
Monohammus titillator, Fab.
* *Leptostylus transversatus*, Ches.
Lema trilineata, Oliv.
Chlamys plicata, Fab.
† *Bassaræus croceipennis*, Lec.
Cryptocephalus binominis, Newm.

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|----------------------------------|---------------------------------|
| Pachybrachys, sp. | † Anthicus pallens, Lec. |
| * Metachroma floridanum, Crotch. | vicinis La.† |
| Lina scripta, Fab. | ? vicinis var. |
| Haltica ignita, Ill. | Attelabus analis, Ill. |
| † Epitragus tomentosus, Lec. | * Pachnæus opalus, Oliv. |
| † Polypleurus nitidus, Lec. | * distans, Horn. |
| † Xylopinus saperdioides, Oliv. | * Artipus floridanus, Horn. |
| Opatrinus notus, Say. | † Listronotus setosus, Lec. |
| Blapstinus metallicus, Fab. | † Macrops cryptops, Dietz. |
| † Crypticus obsoletus, Say. | Hylobius pales, Hbst. |
| * Phaleria puncticeps, Lec. | Otidocephalus myrmex, Hbst. |
| † longula, Lec. | * Notolomus basalis, Lec. |
| † picipes, Say. | * Conotrachelus pusillus, Lec. |
| Diaperis hydni, Fab. | * Cryptorhynchus lutosus, Lec. |
| ?* Tachyporus, n.s. | † oblongus, Lec. |
| † Platydemia micans, Horn. | † Rhyncophorus cruentatus, Fab. |
| † Hymenorus densus, Lec. | Sphenophorus cariosus, Oliv. |
| * floridanus, Casey. | sculptilis, Uhler. |
| † Hyporhagus punctulatus, Thoms. | placidus, Say. |
| † Oxacis thoracica, Fab. | Cossonus corticola, Say. |
| * Mecynotarsus elegans, Lec. | impressifrons, Bohm. |
| † Formicomus scitulus, Lec. | * Mesites rufipennis, Lec. |
| Anthicus difficilis, Lec. | Xyleborus pubescens, Zimm. |

Cicindela—*C. tortuosa* may probably be found active at all seasons, as it was taken on the Indian river, February 9th. It occurred abundantly on the borders of the lake, and also on moist, sandy places in the hummock. *C. marginata* appeared February 21st, and sparingly thereafter. *C. media* appeared on the beach March 1st, and became very abundant onward.

Carabida—*Tachys columbiensis* (undescribed) was seen March 1st, and became abundant on the lake shore, seemingly at home in salt water. *Platynus floridanus* was common on the coast after February 25th, and also on land under all kinds of rubbish where there was moisture. *Tetragonoderus intersectus* and *Selenophorus stigmatus* were taken in the garden patches under the dry fallen leaves of vegetables—as cabbage, beets, etc., on March 5th, and thereafter frequently.

Dytiscidæ—Hydrophilidæ.—The species listed were taken alive on the ocean side of the lake, and, with one exception, had probably fallen into it during a nocturnal flight from some fresh water lake on the main land. However, *Philhydrus simplex* was quite abundant under stones and sticks on the shores of the lake, and the night of the 10th of March being damp and sultry, a flight occurred, many coming into the house to the light. This form, though only .09 to .11 inch in length, is united with the northern *ochraceus*. *Gyrinidæ* were seen in abundance in a small lake on the main land.

Staphylinidæ—Belonuchus formosus, var. This variety was very abundant at all times in rotting oranges and under damp rubbish; it differs from the typical form in being altogether rufous, except the last two abdominal segments, black. No intermediate forms have been met with, and Mr. Schwarz states it occurs abundantly over all Florida.

Tachyporus, sp.—Two examples were taken under pine bark, greatly resembling my examples of *T. scitulus* from Sweden; the thorax and elytra are identical in coloration, but are not perceptibly punctured when viewed with a lens; the abdomen is more finely margined, and the length is only .06 to .07 inch. *Bledius punctatissimus*, and *B. basalis*.—The latter inhabits the wet sand bordering the lake in countless multitudes, and with it the former, but in much less abundance. *B. fumatus* was not seen till April 1st, and afterwards rarely. One of the types of this species was from Southern California.

Brachypeplus glaber.—Five examples of this curious and still rare beetle were taken under the bark of a dead, standing pine, with *Cossonus impressifrons*. Previously I had one example taken near St. Augustine, and the types were from Enterprise, Florida; according to Mr. Schwarz, no others are known in North American collections.

Mycetophagidæ.—Belonging to this family several examples were taken in April, of what may, perhaps, be new either generically or specifically, or both. They were sheltering in the folds of Palmetto leaves, on the blossoms of which Mr. Schwarz took them abundantly, both at Lake Worth, and also at Biscayne Bay, and also the larvæ under the bark of various trees; and he also states that it occurs in the West Indies, in Costa Rica, and was taken at the Chicago Exposition, in dried fruits (or seeds?) from Central America.

Monotoma fulvipes occurred abundantly in rotting oranges, with *Smicrips hypocoproides* and several small *Nitidulidæ*.

Scarabæidæ—*Copris gopheri*, *Aphodiust roglodytes* and the Histeride *Chelioxenis xerobatis* were taken 12 or 15 feet under ground, at a depth of about five feet, with the great sand-digging tortoise, *Gopherus polyphemus*. *Cremastochilus Harrisii*.—An example was taken April 4th, with a large ant. *Trichius texanus* occurred abundantly in the blossoms of Magnolia, April 10th.

Cerambycidæ—*Plectromerus dentipes* was taken, March 5th, by bush-beating, and the imago, pupæ and larvæ were found abundantly in the dead branches of a species of *Schrankia*, which produces the so-called "lucky bean," and which is popularly termed "wait a bit," which one will perforce certainly do on coming in contact with its retrose thorns. *Callichroma splendidum*.—Though I did not take this species, examples were seen which had occurred. These had probably bred in some of the swamps some distance inland.

Tenebrionidæ—*Opatrinus notus* was at all times excessively abundant, harbouring under boards, etc., on the dry sand. It breeds around the stem of the cabbage Palmetto, among the bases of the fallen leaves. *Crypticus obsoletus* was quite abundant in the same situations, and with it *Platydemia nitens*, though less numerous. *Phaleria puncticeps* was rare on the ocean beach, while *P. longula* and *picipes* appeared about March 1st, and gradually became very abundant.

Hyporhagus punctatus—Several examples were taken under the bark of dead seagrape (*cocolobus*), where they seemed to be in hibernation, though exposed to the sun with a midday temperature of 85°.

Anthicidæ—*Mecynotarsus elegans* was abundant in cultivated places on spots of sand hot enough to blister. It is difficult to capture on account of its swift, intricate gyrations. A minute ant inhabits the same places, and goes through the same movements. It may be a question whether the ant has learned these motions from the beetle or the beetle from the ant, but the advantage in one direction seems to be on the part of the beetle, as it is usually safe from beetle hunters till accidentally discovered. *Formicomus scitulus* was also abundant under boards and the dead leaves of garden vegetables where there was sand. *Anthicus*, *sp.*: Several examples were taken under dry cut grass with *Silvanus rectus*.

It is very close to the California *confinis*, but may be distinguished by the punctuation being generally finer. It may be a race of *vicinus* without banded elytra and smaller than the type.

Rhyncophora—*Artipus floridanus*, popularly known as the "rose bug," does not seem to hibernate at this season, if indeed it ever does; it exists in great numbers and does as much mischief as its northern namesake; though polyphagous, it seems to have a special fondness for citrus, particularly the lime, destroying the blossoms and young fruit, and likewise nipping the margins of the leaves, which become white, giving the tree a stunted, frosted appearance. On the main land this beetle feeds on the leaves of the live oak, and of such, many are of a brilliant verdigris-green colour, instead of the creamy white of those raised on *citrus*. *Macrops cryptops* and *Listronotus setosus* are found abundantly in the flowers of *Sagittaria*. *Notolomus basalis* abound from the middle of February till the various Palms are out of bloom. *Cryptorhynchus lutosus* breeds abundantly in the disks (rods) of an abnormal leguminous shrub, *Ecastophyllum brownei*. The most of the fruit ripens and falls from the bush before February, at which time the beetles escape, but the few belated disks found ripening, in nearly every instance contained a beetle in some stage. The determination of both beetle and plant is due to Mr. Schwarz, who had previously taken this insect at Biscayne Bay.

Mesites rufipennis—One example, ♂, was taken on the beach; the antennæ are inserted about the middle of the beak, which is coarsely punctured to the tip, and has the usual frontal fovea and deep groove extending in front of the insertion of the antennæ; on its under side is a deep broad groove extending from the tip to the gula. This species resembles closely immature examples of *M. subcylindricus*, but is more depressed, and the elytral intervals are less convex and more finely punctulate.

Scolytida—The examination of dead hardwood indicated that several species of this family were abundant in their season. The larvæ of one small species was observed in almost incredible numbers boring outwards in the bark of *Ficus aurea*, preparatory to pupation; they were so close together that the surface of the bark could scarcely be seen. They were white, about .06 inch long, and too numerous to make traceable galleries under the bark, not being wood borers.

LIFE HISTORY OF PAPILIO ZOLICAON.

BY ALICE M. JORDAN, NAPA, CAL.

Egg.—On September 2nd, 1893, it was found back of Napa College Laboratory, laid singly on the stem of the flower of wild anise. Nearly spherical, base slightly indented, smooth, bluish-white with grayish shade on one side. Diameter, 1.245 mm. It hatched September 5th, bursting the shell in halves; the shell was white.

First larval stage.—Head rounded, black and shining. Body is largest near the head, with short black hairs rising from two rows of reddish-brown tubercles on segments 2, 3, 4, 5, 6, 9, 10, 11 and 12 on each side of the centre of the dorsal surface, one row near the centre, the other quite low on the side. On segments 7 and 8 are a number of irregular-shaped white spots. Coloured dark brown, scent organs bluish-white.

September 6—Diameter, .65 mm.; length, 3.40 mm.

"	7	"	.80	"	3.90	"
"	8	"	.89	"	4.38	"
"	9	"	.98	"	4.75	"
"	11	"	1.05	"	5.90	"
"	12	"	1.08	"	6.00	"
"	13	"	1.20	"	6.40	"
"	14	"	1.45	"	6.85	"
"	15	"	1.58	"	6.89	"
"	18	"	1.64	"	7.30	"
"	19	"	1.69	"	7.40	"
"	20	"	1.70	"	7.44	"

Second larval stage.—Head slightly retracted under joint 2; rounded, greenish with a black v-shaped line, the lower part of the v at the upper part of the head, and a short black line in centre of v and two on each side at base. The tubercles on segments 2, 3, 4, 5, 6, 9, 10, 11 and 12 are more hairy. The irregular white spots on segments 7 and 8 are somewhat larger. Both the dorsal and ventral sides are brown.

September 21—Diameter, 1.98 mm.; length, 7.55 mm.

"	22	"	2.00	"	8.00	"
"	23	"	2.20	"	8.35	"
"	25	"	3.00	"	10.25	"
"	26	"	3.50	"	11.00	"
"	27	"	4.00	"	12.00	"
"	28	"	4.00	"	12.00	"

Third larval stage.—Head as before; tubercles on 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 and 12 are hairless and of a bright orange colour. The body is brown on dorsal side and brown mottled with green on ventral side. Scent organs yellow and slightly larger than before.

September 29—Diameter, 4.10 mm.; length, 18. mm.

"	30	"	4.10	"	"	19.	"
"	31	"	4.30	"	"	20.	"
October	2	"	4.50	"	"	21.	"
"	3	"	6.00	"	"	21.	"
"	4	"	6.50	"	"	21.5	"

Fourth larval stage.—Head as before; body smooth, ventral side light green mottled with brown; dorsal side slightly yellowish on segment 2 round scent organs; from 2 to 12 the segments are in colour,—in the centre of each a black line in which are four yellow spots, two on each side; on each side of the black line there is a narrow bluish line; on the outside of these is a brown line, which is on the joint, and when the caterpillar is not crawling these brown lines are invisible. The 12th segment is bluish mottled with black. Scent organs are yellow.

October 5—Diameter, 6.00 mm.; length, 25. mm.

"	6	"	6.50	"	"	26.	"
"	7	"	6.98	"	"	30.	"
"	8	"	7.50	"	"	35.	"
"	9	"	8.00	"	"	40.	"
"	10	"	9.00	"	"	40.	"
"	11	"	10.50	"	"	40.	"
"	12	"	10.50	"	"	43.	"

From the 12th of October until the 23rd, it remains the same size, and on the 23rd it attached the 12th segment to a stem of the food plant, spun a web until the web was between the 6th and 7th segments, drawing itself together as much as possible, it was ready to go into the next stage.

Chrysalis.—Cylindrical, the abdomen tapering, a slight depression between thorax and abdomen, a blunt trigonate thoracic prominence projecting forward parallel with a similar process over each eye; a slight lateral projection at base of wing-case and a row of subdorsal abdominal elevations, four of which are most distinct, also a row of openings lower down on each side. Colour light green mottled with light brown; wing-cases same colour, only streaked longitudinally instead of being mottled; the end of the thoracic projection is a dark brown; the similar processes over each eye are darker brown. A narrow band of dark brown extends the length of the body on both sides; from these bands extending along the base of the wing-cases are small elevations, seven of which are very distinct. October 25th: diameter, 7 mm.; length, 27 mm.

THE COLEOPTERA OF CANADA.

BY H. F. WICKHAM, IOWA CITY, IOWA.

IV. THE PLEUROSTICT SCARABAEIDÆ OF ONTARIO AND QUEBEC.

In this group we have in some of the genera a return to the cephalic and thoracic ornamentation by horns or tubercles in the males, as shown in the *Coprophaga*; however, none of the Canadian species would be thus misplaced by anyone having even a slight acquaintance with the family, as aside from this character the resemblance is slight. From some of the *Melolonthinæ* they are not so readily distinguished, except by the position of the spiracles, as defined in a previous article. The genera may be thus parted among themselves:

- A. Claws of tarsi unequal in size.
 - b. Length not more than about $\frac{1}{2}$ in. Antennæ 9-jointed.
 - Elytra conjointly very convex above, often more or less distinctly striate and punctate in rows.....*Anomala*.
 - Elytra flat, distinctly sulcate*Strigoderma*.
 - bb. Length greater, nearly or quite an inch. Antennæ 10-jointed.
 - Elytra immaculate.....*Cotalpa*.
 - Elytra with black spots*Pelidnota*.
- AA. Claws of tarsi equal.
 - c. Very small (about $\frac{1}{25}$ in.). Colour brown, with indistinct lighter marks, thorax distinctly channelled.....*Valgus*.
 - cc. Larger (.40 to above an inch).
 - d. Elytra deeply sinuate behind the humeri.....*Euphoria*.
 - dd. Elytra without more than a faint indication of this sinuation.
 - e. Thorax much narrower than elytra, often much narrowed at base.
 - f. Size small (.50 in. or less).
 - Colour uniform black.....*Cremastochilus*.
 - Elytra luteous with black spots.....*Gnorimus*.
 - Elytra rufotestaceous, or with transverse bands of that colour and white*Trichius*.
 - ff. Size large (nearly an inch), colour uniform.....*Osmoderma*.
 - ee. Thorax not narrowed at base beyond the effect produced by the rounding of the sides and about as wide as the elytra.
 - g. Head entirely unarmed, clypeus simple.....*Cyclocephala*.

- gg. Head with a low transverse carina anteriorly,
 clypeus always toothed.
 Clypeus simply bidentate at tip.....*Ligyryus*.
 Clypeus with an elevated tridentate process
 before the tip.....*Aphonus*.
 ggg. Head with a long horn (♂) or a tubercle (♀) on
 the vertex*Xyloryctes*.

The placing of a specimen in position by means of the claws is easy, as the inequality in the inner and outer ones in the species comprised in group A is very marked. As most of the genera have but one species belonging within our faunal limits, they present no difficulty in the way of correct specific determination.

ANOMALA, Kæppe.

Two species of very variable colour and rather small size (.30 to .40 in.) are found here.

Thorax with distinct basal marginal line; colour variable, elytra usually with two transverse bands of dark spots, ..*undulata*, Mels.

Thorax without basal marginal line, colour black to yellow.....*lucicola*, Fabr.

STRIGODERMA, Burm.

One species (*S. arboricola*, F.) about .40 inch. in length, resembling *Anomala* in form, but the elytra are flat and distinctly sulcate. The thorax is dark brown with a metallic lustre, the outer and basal margins pale, the elytra are clay-coloured. It may be found on flowers during the day.

PELIDNOTA, MacLeay.

The "grape beetle," *Pelidnota punctata*, Linn., is our only representative. It is about an inch in length, brownish yellow, a black spot near the middle of the thoracic side margin, and three on each elytra (Fig. 28, *a* larva; *b* pupa; *c* beetle; *d* anal mark on larva; *e* antenna, and *f* leg of larva).

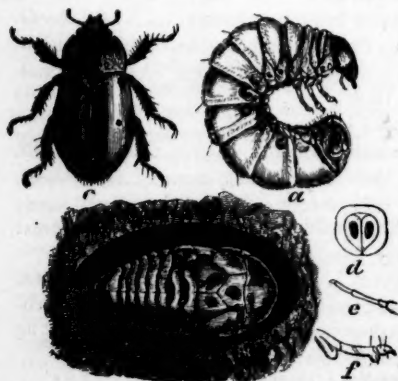


Fig. 28.

COTALPA, Burm.



Fig. 30.

One species, the "goldsmith beetle," *Cotalpa lanigera*, Linn. (Fig. 29, beetle; fig. 30, larva), is found in our fauna. It is about the size of the preceding species, and has the head and thorax golden, the elytra cream-coloured, with a slight bluish cast. Beneath metallic green, woolly.



Fig. 29.

CYCLOCEPHALA, Latr.

C. immaculata, Oliv., has once been reported by Mr. Moffat. It is a yellowish or reddish testaceous insect about half-an-inch in length, the head dark or even black. It bears some slight resemblance to certain *Lachnosterna*, but has shorter legs.

LIGYRUS, Burm.

The two beetles belonging to this genus differ greatly in size, and are otherwise easily separated. They are brownish in colour, heavier than *Lachnosterna* in appearance and with shorter legs. *Ligyru relictu*s breeds in old manure heaps.

Thorax without tubercle in front; length, .70-.90 in. *relictu*s, Say.

Thorax with a tubercle near the middle of anterior margin; length, .48-.67 in. *gibbosu*s, De G.

APHONUS, Lec.

A single species bearing considerable resemblance in size, form and colour to *Ligyru gibbosu*s is recorded. It may easily be distinguished, however, by the lack of the thoracic tubercle and by the clypeus bearing a tridentate process before the tip, whence the name *A. tridentatu*s, Say.

XYLORYCTES, Hope.

To this genus belongs the large *X. satyru*s, Fabr., which attains a length of above an inch and is correspondingly heavy. The male has a long horn, curved backwards at tip, while the female has the head ornamented simply with a small tubercle on the vertex.

EUPHORIA, Burm.



Fig. 31.

Two species belong here, similar in shape, but easily separated. These are *E. inda*, Linn., (Fig. 31) and *E. fulgida*, Fabr. (Fig. 32), distinguished thus:

Thorax very hairy above, elytra luteous with



Fig. 32.

small, black spots.....*inda*, Linn,
 Thorax naked and polished above, green with yellow margin, elytra
 brownish red, with green surface lustre in places...*fulgida*, Fabr.

CREMASTOCHILUS, Knoch.

The only recorded species is *C. harrisii*, Kirby, a rather elongate and flattened, black insect, .40 inch in length, the surface shining. The thorax has a very peculiar appearance, because of the angles being separated from the disk by rather deep impressions. The mentum is large and somewhat cupuliform, with a rather deep and broad notch behind. We figure it after Dr. Horn (Fig. 33).

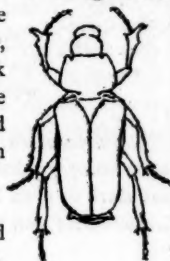


Fig. 33.

OSMODERMA, Lep.

This genus includes two very large, dark coloured beetles, with the thorax much narrower than the elytra. They may be known apart thus:



Fig. 34.

Elytra nearly smooth, polished...*cremicola*, Knoch.
 Elytra rough, scabrous, thorax with a rather deep
 channel.....*scabra*, Beauv.

Fig. 34 represents *O. scabra*.

GNORIMUS, Lep.

G. maculosus, Knoch, is the only species. It resembles *Trichius*, but the elytra are yellowish (luteous) with numerous black spots.

TRICHIUS, Fabr.

Three species are on the Canadian lists; all are to be found on flowers, especially wild rose and *Spiraea*, during the heat of the day, and fly readily when disturbed. The elytra are usually marked with transverse white bands. They may be tabulated as follows:

- A. Elytra rufo-testaceous, without transverse bands or velvety lateral space.....*bibens*, Fabr.
- AA. Elytra with white transverse bands and lateral velvety spaces.
 - Second and fourth elytral intervals moderately densely punctate.....*piger*, Fabr.
 - Second and fourth intervals very sparsely punctate...*affinis*, Gory.

All are only moderate-sized insects, with rounded thorax, narrower than the elytra, and very long legs.

VALGUS, Scriba.

A very small, brown species, *canaliculatus*, Fabr., (.25 inch), looking something like a diminutive *Osmoderma*, is our only representative. The thorax is distinctly channelled, the elytra very much flattened, and with indistinct yellowish or whitish markings across the middle and near the tip.

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ERRATUM.—Page 229, fifth line from bottom, for "Club three-jointed" read "Club many-jointed."

Mailed September 6th.

